

Soraya Teerawattanakitti 2009: Remediation of Toluene And Trichloroethylene Contaminated Groundwater in Different Media Types Using Chemical Oxidation. Master of Engineering (Environmental Engineering), Major Field: Environmental Engineering, Department of Environmental Engineering. Thesis Advisor: Assistant Professor Cheema Soralump, Ph.D. 117 pages.

The objective of this experimental investigation was remediation of TCE- Contaminated groundwater in difference media types using potassium permanganate (KMnO_4). And these experiments were applied to ex situ remediation. The experiments were to determine the optimal KMnO_4 dosage and evaluate the effects of the total organics matter in different media types on efficiency of TCE oxidant. Three sediments (clay, silty sand and sand) were used in this test. Remediation TCE-contaminated used KMnO_4 0.2 M at pH7, Shaker speed 200 RPM and retention time was 3 hours. The oxidation reaction was quenched at the appropriate time interval by the addition of 0.2 M Sodium bisulfate solution. Study results showed that the 22 mmol (110 ml) of KMnO_4 dosage was 98.2% remediation efficiency and 20 mmol (100 ml) KMnO_4 dosages was 97.3% efficiency respectively. But anyway this experiment chooses 22 mmol of KMnO_4 dosage because remediation efficiency was not significant difference.

TCE-contamination remediation efficiency in 3 different types of media showed that the greatest efficiency remediation was sand media. It was efficiency 78.7%, silty sand and clay 70.0 %, 12.2 % respectively. And Cl^- ion after oxidation were 63.9 % in sand , silty sand 55.5 % , and Clay 50.3 % respectively .The other factor that influence on remediation efficiency was total organics matter . Results reveal that Sand had the lowest of total organics matter 0.02 % and silty sand and Clay 0.14% and 0.21% respectively .That related to remediation efficiency. When using KMnO_4 in chemical oxidation reaction will react both of target and non target organics matter. So it was important to look at the chemical oxidation demand of the system at the total organics carbon as evaluation parameter for chemical oxidation.

Student's signature

Thesis Advisor's signature